References on Arthritis Research Using ALZET® Osmotic Pumps


**Agents:** Amyloid protein, beta (25-35)  
**Vehicle:** Saline, sterile;  
**Route:** CSF/CNS (hippocampus);  
**Species:** Rat;  
**Pump:** Not Stated;  
**Duration:** 14 days;  
**ALZET Comments:** Dose (3 to 6 nmol/d); animal info (Sprague-Dawley female rats, 10 weeks, 235 g); Brain coordinates (lateral, −3.3 mm from the bregma; posterior, 2.0 mm from the midline; ventral, −2.5 mm from the dura); neurodegenerative (Alzheimer’s disease);


**Agents:** KN-93  
**Vehicle:** PBS;  
**Route:** SC;  
**Species:** Mice;  
**Pump:** Not Stated;  
**Duration:** 28 days;  
**ALZET Comments:** Dose (5 umol/kg/day); Controls received mp w/ vehicle; animal info (Ten week old, male C57BL/6 mice);


**Agents:** Clozapine-N-oxide  
**Vehicle:** Saline;  
**Route:** Abdomen;  
**Species:** Mice;  
**Pump:** Not Stated;  
**Duration:** 6 weeks;  
**ALZET Comments:** Dose (180 μg/day); Controls received mp w/ vehicle; animal info (Female NMRI mice and female BALB/c mice, 6-12 weeks old);

Q7656: H. J. Qin, et al. Tofacitinib treatment aggravates Staphylococcus aureus septic arthritis, but attenuates sepsis and enterotoxin induced shock in mice. Scientific Reports 2018;894

**Agents:** AMD3100  
**Vehicle:** Saline;  
**Route:** Bone (tibia);  
**Species:** Mice;  
**Pump:** Not Stated;  
**Duration:** 28 days;  
**ALZET Comments:** Dose (15 mg/kg/day); 10% Peg 300, 40% water used; Controls received mp w/ vehicle; animal info (Female NMRI mice and female BALB/c mice, 6-12 weeks old); dependence;


**Agents:** Glycine  
**Vehicle:** Saline;  
**Route:** CSF/CNS (Intrathecal);  
**Species:** Rat;  
**Pump:** 2002;  
**Duration:** 14 Days;  
**ALZET Comments:** Dose (0.1 umol/h); Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats, 200-250 g); behavioral testing (PWMT test);


**Agents:** Antagonist of Ca2+ release-activated Ca2+ (CRAC) channels  
**Vehicle:** Saline;  
**Route:** SC;  
**Species:** Mice;  
**Pump:** Not Stated;  
**Duration:** 28 days;  
**ALZET Comments:** Dose (0.5 μg/kg/day); Controls received mp w/ vehicle; animal info (Male, 6-10 weeks old, 30 g); Antagonist of Ca+ release-activated Ca2+ channels aka YM-58483; dependence;


**Agents:** Interleukin-1 receptor antagonist  
**Vehicle:** Saline;  
**Route:** IP;  
**Species:** Mice;  
**Pump:** 1007D;  
**Duration:** 2 weeks;  
**ALZET Comments:** Dose (37.5 μg/hr); Controls received empty mp; animal info (12 week old female C57BL/6 mice);

**Agents:** Antibody A11; compound 59 **Vehicle:** Saline; **Route:** IP, SC; **Species:** Mice; **Pump:** 1004, 2004; **Duration:** 4 weeks, 8 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, C57BL6J, 25-30g); pumps replaced every 4 weeks; Dose (Antibody: 1.5 ug/day; Compound 59: 5, 25, or 50 mg/kg/day);


**Agents:** T140 **Vehicle:** PBS; **Route:** SC; **Species:** Guinea pig; **Pump:** 2006; **Duration:** Not Stated;

**ALZET Comments:** Dose (180 ug/d); Controls received mp w/ vehicle; animal info (9 month old male Hartley guinea pigs weighing about 600g); pumps replaced every 6 weeks; Therapeutic indication (osteoarthritis);


**Agents:** Tofacitinib **Vehicle:** PEG 300; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 6 days;

**ALZET Comments:** animal info (Wild-type CD1); Controls received mp w/vehicle; dose (15 mg/kg/day); cancer; enzyme inhibitor (JAK3);


**Agents:** Antibody (hCRACM1-IgG); YM-58483 **Vehicle:** Saline; Intralipose; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** hCRACM1-IgG Dose (1 or 10 mg/kg), YM-58483 Dose (1.5mg/kg); YM-58483 was mixed with 10% Intralipose, which is an i.v. lipid emulsion containing 10% soybean oil, 1.2% egg yolk phospholipids, and 2.2% glycerin; Controls received mp w/ vehicle; hCRACM1-IgG is a neutralizing monoclonal antibody targeting human CRACM1; YM-58483 is a small molecular CRAC blocker; Immunology (transplant);


**Agents:** Nicotine **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 2006; **Duration:** 42 days;

**ALZET Comments:** Dose (15 mg/kg/day); Controls received mp w/ vehicle; animal info (male DBA/1J mice);


**Agents:** Prolactin **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 28 days;

**ALZET Comments:** animal info (Male Sprague-Dawley rats weighing 200–250 g);


**Agents:** Morphine hydrochloride **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML1; **Duration:** 5 days;

**ALZET Comments:** Dose (41–48 mg/kg/day); animal info (8-week-old male Wistar rats weighing 200–240 g); Therapeutic indication (Knee arthritis);


**Agents:** Peficitinib **Vehicle:** PEG, Acetic acid; **Route:** IP; **Species:** Rat; **Pump:** 2ML2; **Duration:** Not Stated;

**ALZET Comments:** Dose (0.12, 0.24, and 0.48 mg/day per body); Controls received mp w/ vehicle; Resultant plasma level (7.0 ng/mL, 18 ng/mL, and 35 ng/mL on day 13, and 7.1 ng/mL, 13 ng/mL, and 30 ng/mL on day 16);
Agents: AMD3100 Vehicle: PBS; Route: SC; Species: Rat; Pump: 2006; Duration: 6 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (16 weeks old, Sprague-Dawley; 400-500 g); Therapeutic indication (Osteoarthritis, subchondral bone); Dose (22.3 mg/ml);

Agents: AMD3100 Vehicle: PBS; Route: Not Stated; Species: Rat; Pump: 2004; Duration: 8 weeks;
ALZET Comments: Dose (3 mg/day); Controls received mp w/ saline; animal info (female, Lewis, 6-8 weeks old, 160-180g); animal info (female, Lewis, 6-8 weeks old, 160-180g); immunology; delayed delivery for 5 days; Dose (53 mg/kg/day);

Q4897: Gisela Segond von Banchet, et al. Long-Lasting Activation of the Transcription Factor CREB in Sensory Neurons by Interleukin-1b During Antigen-Induced Arthritis in Rats. Arthritis & Rheumatology 2016;68(2):532-541
Agents: Anakinra Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2ML4; Duration: 26 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (female, Lewis, 6-8 weeks old, 160-180g); animal info (female, Lewis, 6-8 weeks old, 160-180g); immunology; delayed delivery for 5 days; Dose (180 ug/day);

Agents: MG132 Vehicle: DMSO; PEG 300; Route: SC; Species: Mice; Pump: 1004; Duration: 8 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (C57BOl/J mice (30 males, 2 months old)); enzyme inhibitor (proteasome, general);
Agents: Peptide, OP-3-4 Vehicle: PBS; DMSO; Route: SC; Species: Mice; Pump: Not Stated; Duration: 49 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, DBA/1J, 7 weeks old); pumps replaced after day 35 or 42; 20% DMSO used; peptides; "a sustained-release carrier for OP-3-4 needs to be developed since peptide drugs are unstable and aggregate easily in vivo. The effects of OP-3-4 in this study were achieved using infusion pumps" pg 13

Agents: Water, distilled Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2ML4; Duration: 8 weeks;
ALZET Comments: Controls received mp w/ vehicle; functionality of mp verified by plasma levels and knee articular cartilage; pumps replaced every 4 weeks; post op. care (buprenorphine 50 ug/kg SC); behavioral testing (static weight bearing, exploratory motor behavior); long-term study;

Agents: AG1478; RS504393 Vehicle: DMSO; water, deionized; Route: SC; Species: Rat; Pump: 2ML4; Duration: 10 weeks;
ALZET Comments: Controls received mp w/ vehicle; functionality of mp verified by plasma levels and knee articular cartilage; pumps replaced every 4 weeks; %50 of DMSO; long-term study; enzyme inhibitor (EGFR and CCR2 inhibitors); EGFR inhibitor AG1478, CCR2 inhibitor RS504393; Dose: (AG1478) 21 nmoles/kg/hour; (RS504393) 200 nmoles/kg/hour

Agents: Tofacitinib Vehicle: DMSO; Route: SC; Species: Mice; Pump: Not Stated; Duration: 5 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (female, SKG mice, arthritis induction); immunology; enzyme inhibitor (JAK3)

Agents: CT99021 Vehicle: DMSO; PEG 400; Route: SC; Species: Mice; Pump: Not Stated; Duration: 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL6J, 10 weeks old); 50% PEG 400 used; 50% DMSO used; CT99021 is a GSK-3 inhibitor;

Agents: Interleukin-1 receptor antagonist Vehicle: Saline; Route: SC; Species: Mice; Pump: 2004; Duration: 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL6, 8 weeks old); functionality of mp verified by serum levels; comparison of injection vs mp; stress/adverse reaction: (see pg. 4); post op. care (buprenorphine); "...no significant differences were detected for any of the outcome measures in mice receiving systemic saline vs osmotic pump or IP injections." pg 4; pumps removed after 28 days;

Agents: Tofacitinib Vehicle: DMSO; PEG 300; Route: SC; Species: Mice; Pump: Not Stated; Duration: 36 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, DBA/1, 10-12 weeks old); functionality of mp verified by plasma levels; pumps replaced every 19 days; 33% DMSO used; dose-response (pg. 168); toxicology; immunology; Tofacitinib is a janus kinase inhibitor; enzyme inhibitor (JAK3)

Agents: Prolactin, ovine Vehicle: Not Stated; Route: SC; Species: Rat; Pump: Not Stated; Duration: 6 days; 21 days;
ALZET Comments: Animal info (male, Sprague Dawley, 200-250g); functionality of mp verified by serum levels at 21 days; behavioral testing (hind paw pain); immunology;
**Agents:** AMD 3100  
**Vehicle:** PBS; **Route:** SC; **Species:** Guinea pig; **Pump:** 2006; **Duration:** 12 weeks;  
**ALZET Comments:** Controls received mp w/ PBS; animal info (0.88 kg +/- 0.21 kg); pumps replaced once every 6 weeks; long-term study

Q2585: E. Schurgers, et al. Pulmonary inflammation in mice with collagen-induced arthritis is conditioned by complete Freund’s adjuvant and regulated by endogenous IFN-? European Journal of Immunology 2012;42(12):3223-3234
**Agents:** Etanercept  
**Vehicle:** PBS; **Route:** Not Stated; **Species:** Mice; **Pump:** 2004; **Duration:** Not Stated;  
**ALZET Comments:** Control animals received mp w/ vehicle; animal info (IFN gamma R KO, DBA/1)

**Agents:** Cathepsin S; fractalkine  
**Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001; **Duration:** Not Stated;  
**ALZET Comments:** Animal info (adult, female, Lewis, 180-200 g); peptides

**Agents:** Anakinra  
**Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 1 week;  
**ALZET Comments:** Animal info (male, Lewis, 6-9 wks old); half-life “4-6 hours” pg 78; pharmacokinetic study; pk study

**Agents:** APO866  
**Vehicle:** Propylene glycol; saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, DBA/1, 7-8 wks old); half-life (~8 hours in humans pg 1876); APO866 is a small molecule inhibitor in human fibroblasts in vitro and in murine collagen arthritis; A maximum tolerated dose of APO866 of 0.126 mg/m2/hour in human clinical trials and 0.18 mg/m2/hour in rats has been reported” pg 1868

**Agents:** Anakinra  
**Vehicle:** Saline; Sodium citrate; EDTA; **Route:** Tween 80; **Species:** Rat; **Pump:** 2ML1; **Duration:** 7 days;  
**ALZET Comments:** Controls received vehicle; animal info (male, Lewis, 7-9 weeks old; adjuvant-induced arthritis); IL-1B antagonist; 0.5mM EDTA; 0.1% Tween 80

**Agents:** Etanercept  
**Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2ML4; **Duration:** 3, 21 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Lewis, 6-8 wks, 160-180 g); ALZET intrathecal catheter used; schematic drawing with ALZET pump and catheter

**Agents:** Ketamine; Morphine  
**Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2ML4; **Duration:** 21 days;  
**ALZET Comments:** Controls received mp w/ vehicle; tolerance; ALZET brain infusion kit used; half-life pg 477 (2.5 hrs in CSF (ketamine); 2.1 hrs (morphine)); animal info (Female, Lewis, 6-8 wks old, 160-180 g); dorsal laminectomy; behavioral testing (pain related behavior)
P9905: M. Stolina, et al. RANKL inhibition by osteoprotegerin prevents bone loss without affecting local or systemic inflammation parameters in two rat arthritis models: comparison with anti-TNF-alpha or anti-IL-1 therapies. Arthritis Research & Therapy 2009;11(6):U251-U265

**Agents:** Anakinra  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** Not Stated  
**ALZET Comments:** Animal info (Lewis, 7 to 8 wks old, AIA, CIA)


**Agents:** CP-690550  
**Vehicle:** PEG 300  
**Route:** SC  
**Species:** Rat; Mice  
**Pump:** 2004; 2ML2  
**Duration:** 2 weeks; 28 days  
**ALZET Comments:** Controls received mp w/ vehicle or no pump; dose-response (fig. 1); enzyme inhibitor (JAK3, janus kinase 3); animal info (male, DBA/J1, male, Lewis); "it was necessary to administer CP-690550 via osmotic pumps due to the poor (PK) properties of this compound in rodents.”


**Agents:** Interleukin-10; interleukin-1 receptor antagonist  
**Vehicle:** Saline; DMSO  
**Route:** SC  
**Species:** Mice (SCID)  
**Pump:** 2004  
**Duration:** 40 days  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by plasma levels; good methods (p.125); peptides; animal info (female, SCID, 4-5 wks old); Rheumatoid arthritis; pump and technique schematics p. 125; stability (with an excellent description of methods) was verified for 40 days @ 37C; 50% DMSO used; "... the application of proteins via osmotic pumps is an affective tool to evaluate the effects of cytokines and inhibitors in vitro.” p. 128


**Agents:** Anakinra  
**Vehicle:** NaCl; citric acid; EDTA; tween 80  
**Route:** IP  
**Species:** Mice  
**Pump:** 1007D  
**Duration:** 7 days  
**ALZET Comments:** Anakinra is an interleukin-1 receptor antagonist; 0.35mM EDTA; 0.07% Tween 80


**Agents:** Estradiol, 2-methoxy-  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 18 days  
**ALZET Comments:** Controls received mp w/ vehicle; comparison of oral gavage vs. mp; animal info (syngeneic LOU, 8-10 wks old, 100-150 g.), Collagen-induced arthritis; “Delivery of 60 mg/kg by an osmotic pump, however, was similar in efficacy to 300 mg/kg oral gavage. This result suggests that a steady-state level of 2ME2 achieved equivalent arthritic inhibition at a lower total dose.” (p. 2124)


**Agents:** Osteogenic protein-1  
**Vehicle:** Lactose  
**Route:** Knee (articular cavity)  
**Species:** Rabbit  
**Pump:** 2004  
**Duration:** 6 weeks  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by separate in vivo test; peptides; post op. care (“appropriate”); animal info (New Zealand, White, 1 yr old); also known as BMP-7 or bone morphogenic protein-7; catheter was secured with polyethylene stents; “The efficacy of the (ALZET Pump) was tested in vivo before beginning the study with good results”; “constant infusion of OP-1 may be the most ideal form of delivery”; long-term study; good methods


**Agents:** Nerve growth factor, recomb. human; glial-derived neurotrophic factor, recomb. human; leukemia inhibitory factor, recomb. human  
**Vehicle:** Saline; Albumin, rat serum  
**Route:** CSF/CNS (intrathecal)  
**Species:** Rat  
**Pump:** 2002  
**Duration:** 14 days  
**ALZET Comments:** Controls received mp w/ vehicle; peptides, animal info (male, Wistar, 220-400 g.)
Agents: TN14003, 4F-benzoyl- Vehicle: Not Stated; Route: SC; Species: Mice; Mice (SCID); Pump: Not Stated; Duration: Not Stated;
ALZET Comments: Cancer (breast carcinoma); immunology; peptides; CXCR4 antagonist; review, see p. 21, 23

Agents: Peptide, WP9QY; antibody, monoclonal, anti-TNF alpha Vehicle: PBS; DMSO; Route: SC; Species: Mice; Pump: 2001; Duration: 19 days;
ALZET Comments: Controls received mp w/ vehicle; dose-response (fig. 1); pumps replaced every 7 days; half-life (p. 1182) “short;” peptides; animal info (male, DBA/1J, 6 weeks old, collagen induced arthritis); 10% DMSO

Agents: Infliximab; immunoglobulin G, human Vehicle: Not Stated; Route: SC; Species: Mice (SCID); Pump: Not Stated; Duration: 2 weeks;
ALZET Comments: Controls received mp w/ human IgG; immunology; animal info (SCID-HuRAg-pit, 6-7 wks old; TNF-alpha inhibitor

Agents: Endostatin Vehicle: PBS; Route: IP; Species: Mice; Pump: Not Stated; Duration: 2 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (1J, 6 week); “compared with the once daily dosing regimen, the administration of endostatin by an osmotic pump achieved a similar arthritis-inhibiting effect at one-tenth of the dose...the administration method using osmotic pump is useful.” pg. 434

Agents: Etanercept Vehicle: Water, sterile; Route: SC; Species: Mice; Pump: 2004; Duration: 28 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, DBA/1, wt, IFNgR-KO, 8-12 weeks old)

Agents: Anakinra Vehicle: Not Stated; Route: SC; Species: Rat; Pump: Not Stated; Duration: 4 weeks;
ALZET Comments: Animal info (female, Lewis, 200g.)

Agents: Estradiol, 17B- Vehicle: PEG; Route: Not Stated; Species: Rat; Pump: 2002; Duration: 14 days;
ALZET Comments: Animal info (OVX, Sprague-Dawley, 200-225 g, female)

Agents: Fentanyl Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML1; Duration: 5 days;
ALZET Comments: Controls received mp w/ vehicle; tolerance; animal info (male, Wistar, 250-320 g)

Agents: AMD 3100 Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 2002; Duration: 14 days;
ALZET Comments: Controls received mp w/ PBS; immunology; animal info (male, 8-12 weeks)

Agents: Interleukin-1 receptor antagonist Vehicle: Not Stated; Route: SC; Species: Mice (transgenic); Pump: 2004; Duration: 4 weeks;

ALZET Comments:


Agents: TN14003, 4F-benzoyl- Vehicle: PBS; Route: SC; Species: Mice; Pump: 1007D; 2002; Duration: 7,14 days;

ALZET Comments: Controls received mp w/ vehicle; dose-response (Fig.2); immunology; peptides


Agents: Muscimol; Bicuculline Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days;

ALZET Comments: Controls received mp w/ vehicle; dose-response; no stress (see pg. 455-6)

R0219: W. B. Van Den Berg. Is there a rationale for combined TNF and IL-1 blocking in arthritis? Clinical and Experimental Rheumatology 2002;20(Suppl. 28):S21-S25

Agents: Insulin-like growth factor I, receptor antagonist Vehicle: Not Stated; Route: Not Stated; Species: Mice; Pump: Not Stated; Duration: Not Stated;

ALZET Comments: "In mice full protection is only achieved with continued dosing in ALZET minipumps." (p. S-24)


Agents: Transforming Growth Factor-B2, soluble receptor Vehicle: Polymyxin B; Route: IP; Species: Mice; Pump: 1007D; 2002; Duration: 7,14, 21 days;

ALZET Comments: Arthritis; controls received empty pumps or mp w/ vehicle; functionality of mp verified by residual aspiration; pumps replaced after 14 days; stability verified by ELISA after infusion (p. 508, 510); soluble TGF-B RII selectively inhibits transforming growth factor-B; peptides; polymyxin B included as endotoxin inhibitor; 2002 pumps used for 7 and 14 day administration, 21-day group received a 1007D pump for final 7 days


Agents: Tumor necrosis factor-a; Interleukin-6 Vehicle: Serum, fetal bovine; Culture medium, RPMI 1640; Route: SC; Species: Mice (SCID); Pump: 1007D; Duration: 7 days;

ALZET Comments: controls received mp w/ vehicle; functionality of mp verified by serum cytokine levels; immunology; peptides; cytokines were recombinant; pump incorrectly called an osmium pump (p. 331); agents administered singly.


Agents: Placental growth factor; vascular endothelial growth factor Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 2001; Duration: 7 days;

ALZET Comments: Angiogenesis


Agents: Interleukin-1 receptor antagonist Vehicle: Saline; sodium citrate; EDTA; Tween 80; Route: SC; Species: Rat; Pump: 2ML1; Duration: 7 days;

ALZET Comments: Controls received mp w/ BSA "to control for nonspecific anti-angiogenic effects of stress associated with implantation of the osmotic minipump." (p. 2605); implantation of pumps delivering BSA caused no angiogenesis; 0.5mM EDTA; 0.1% Tween 80;

**Agents:** Not Stated  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rabbit  
**Pump:** Not Stated  
**Duration:** 14 days  
**ALZET Comments:** Peptides


**Agents:** Naloxone; Naloxone methiodide  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rat  
**Pump:** 2001; 2ML2  
**Duration:** 3 days  
**ALZET Comments:** Dose (3 mg/kg/day); Controls received mp w/ vehicle; animal info (polyarthritic male sprawg dawley rats, 6 weeks old); behavioral testing (foot withdrawal (pain)); Therapeutic indication (Rheumatoid arthritis);


**Agents:** Diethyldithiocarbamate, Sodium  
**Vehicle:** PBS, sterile  
**Route:** SC  
**Species:** Rat  
**Pump:** 2002; 2ML2  
**Duration:** 7, 9 days  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by plasma levels; comparison of IP injections vs. mp; agent also called Ditiocarb or DDTC; arthritis


**Agents:** Interleukin-1 receptor  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rabbit  
**Pump:** Not Stated  
**Duration:** 14 days  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by plasma levels; immunology; peptides; arthritis; soluble interleukin-1 type II receptor used


**Agents:** Hoe 140; Bradykinin, Lys-Leu8-des-Arg9  
**Vehicle:** Saline, sterile  
**Route:** SC  
**Species:** Rat  
**Pump:** 1007D  
**Duration:** 6 days  
**ALZET Comments:** controls received mp w/ vehicle; peptides; agents administered singly and in combination


**Agents:** Interleukin-10  
**Vehicle:** PBS, sterile  
**Route:** SC  
**Species:** Rat  
**Pump:** 2002; 2ML2  
**Duration:** 14 days  
**ALZET Comments:** controls received mp w/ PBS; comparison of footpad injections vs. mp; immunology; peptides


**Agents:** Interleukin-1 receptor antagonist, recomb. human  
**Vehicle:** Not Stated  
**Route:** IP  
**Species:** Mice  
**Pump:** 1007D  
**Duration:** 7 days  
**ALZET Comments:** Controls received mp w/ BSA; immunology


**Agents:** Interleukin-1 receptor antagonist  
**Vehicle:** Not Stated  
**Route:** IP  
**Species:** Mice  
**Pump:** 1007D  
**Duration:** Not Stated  
**ALZET Comments:** Controls received empty pumps or mp w/ vehicle; immunology


**Agents:** Interleukin-1 receptor antagonist  
**Vehicle:** Not Stated  
**Route:** IP  
**Species:** Not Stated  
**Pump:** Not Stated  
**Duration:** 7 days  
**ALZET Comments:** brief mention of mp on p. 247; immunology
**P3995:** S. J. Oliver, et al. Suppression of collagen-induced arthritis by an angiogenesis inhibitor, AGM-1470, in combination with cyclosporin: reduction of vascular endothelial growth factor (VEGF). Cellular Immunology 1995;166(196-206)

**Agents:** Cyclosporin A  
**Vehicle:** PEG 300;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2ML4;  
**Duration:** Not Stated;  
**ALZET Comments:** Photo of rat showing implanted pump (pg. 204); no stress (see pp. 199, 204, 205); immunology; controls received sham surgeries


**Agents:** GI168  
**Vehicle:** DMSO; Sodium citrate buffer;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2ML2;  
**Duration:** 2 weeks;  
**ALZET Comments:** controls received mp w/vehicle; dose-response (see p. 451); immunology; multiple pumps per animal (2); “GI168 had poor oral bioavailability and a short plasma t 1/2 after subcutaneous injection... so minipump delivery was evaluated.” p. 451; enzyme inhibitor (matrix metalloproteinase)


**Agents:** Castanospermine; Mannose, D-; Phosphate, mannose-6-; Phosphate, fructose-1-  
**Vehicle:** Saline;  
**Route:** SC; IP;  
**Species:** Rat;  
**Pump:** 2002;  
**Duration:** 14 days;  
**ALZET Comments:** controls received mp with saline or sham operation; comparison of drinking water admin. of CS vs. mp; immunology


**Agents:** Nicotine hydrogen tartrate; ICI-118,551 Hexamethonium chloride  
**Vehicle:** Saline; Ethanol;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2ML2; 2ML4;  
**Duration:** 16,30 days;  
**ALZET Comments:** comparison of sc injections vs. mp; immunology; ICI-118,551 is a b2-adrenoceptor antagonist; antihypertensive


**Agents:** Tumor necrosis factor-a  
**Vehicle:** Albumin, bovine serum; Water;  
**Route:** Not Stated;  
**Species:** Rat;  
**Pump:** 2ML4;  
**Duration:** 28 days;  
**ALZET Comments:** peptides


**Agents:** Interleukin-6  
**Vehicle:** PBS; Serum, mouse;  
**Route:** SC;  
**Species:** Mice;  
**Pump:** 2ML2; 2ML4;  
**Duration:** 2, 4 weeks;  
**ALZET Comments:** immunology; peptides


**Agents:** Interleukin-2, PE40  
**Vehicle:** NAD;  
**Route:** IP;  
**Species:** Rat;  
**Pump:** 2001;  
**Duration:** Not Stated;  
**ALZET Comments:** Functionality of mp verified by serum levels of IL-2-PE40; comparison of of bid ip injections vs. mp; no stress (see pg. 314); stability achieved for 6 days by adding NAD (p. 308); multiple pumps per animal (2); half-life of 1-2 hours when given ip